

## DATA BASE MANAGEMENT SYSTEMS

B.Tech. III Year I Semester

Course Code	Category	Hours / Week			Credits	Maxumum Marks		
		L	T	P		C	CIA	SEE
CY3103PC	Core	3	1	0	4	30	70	100
		Tutorial Classes : 15		Practical classes : NIL		Total Classes :60		
Prerequisites: A course on "Data Structures".								

### Course Objectives:

- To understand the basic concepts and the applications of data base systems.
- To master the basics of SQL and construct queries using SQL.
- To learn models, data base design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

### Course Outcomes:

- Gain knowledge of fundamentals of DBMS,data base design and normal forms
- Master the basics of SQL for retrieval and management of data.
- Be acquainted with the basics of transaction processing and concurrency control.
- Familiarity with data bases access techniques

## COURSE SYLLABUS

### MODULE- I

**Database System Applications:** A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS

**Introduction to Database Design:** Data base Design and ER Diagrams, Entities, Attributes and EntitySets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual DesignWith the ERModel

### MODULE- II

**Introduction to the Relational Model:** Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical data base design, introduction to views, destroying/altering tables and views.

Relational Algebra, Tuple relational Calculus, Domain relational calculus.

### **MODULE- III**

**SQL: QUERIES, CONSTRAINTS, TRIGGERS:** form of basic SQL query, UNION, INTERSECT and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active data bases.

**Schema Refinement:** Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multi-valued dependencies, FOURTH normal form, FIFTH normal form.

### **MODULE- IV**

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity , Log-Based Recovery, Recovery with Concurrent Transactions.

### **MODULE- V**

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index at a Structures, Hash Based Indexing, Tree base Indexing, Comparison of File Organizations, Indexes and Performance Tuning, Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+Trees: A Dynamic Index Structure.

### **TEXT BOOKS:**

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, *Tata McGraw Hill* , 3<sup>rd</sup> Edition
2. Database System Concepts, Silberschatz, Korth, *McGraw hill*, Vediton.

**REFERENCE BOOKS:**

1. Data base Systems design, Implementation and Management, Peter Rob & Carlos Coronel, 7<sup>th</sup> Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, *PearsonEducation*
3. Introduction to Data base Systems,C.J. Date,*PearsonEducation*
4. Oracle for Professionals, The XTeam, S.Shah and V.Shah, *SPD*.
5. Data base Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, *PHI*.
6. Fundamentals of Database Management Systems, M.L.Gillen son, *WileyStudentEdition*.